

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-48

Name: Platte Lake

County: Charles Mix

Legal Description: T99N-R68W-Sec. 16

GPS: 43°23'20.40"N 98°53'37.84"W

Location from nearest town: 2 ½ miles west of Platte

Date of present survey: June 15-17, 2015 (netting)

Date of last survey: July 10-12, 2006 (netting)

Most recent lake management plan: F-21-R-41 (January 1, 2009 to December 31, 2013)

Management classification: Warmwater Marginal

Primary Game Species	Secondary and Other Species
Northern Pike	Black Bullhead
Yellow Perch	Common Carp
	Largemouth Bass
	Green Sunfish
	Orangespotted Sunfish

PHYSICAL DATA

Surface Area: 60 acres

Watershed: 35 square miles

Maximum Depth: 8 feet

Mean Depth: 5 feet

Lake elevation at time of survey (field observations): Full

Contour map: No

Date: NA

Ownership of lake and adjacent lakeshore properties:

Platte Lake is a 60-acre impoundment located 2.5 miles west of the City of Platte in northern Charles Mix County. The lake derives its name from the proximity to the City, the primary owner of the property on which the dam was constructed. The artificial impoundment was created in 1931 when the Works Progress Administration (WPA) constructed an earthen dam on the lower portion of Platte Creek approximately 5 miles above the point where it enters the Missouri River. To allow for the construction of the dam grade and lake, two easement contracts were granted to the South Dakota Game and Fish Commission. The first easement was given by the City of Platte and included eight tracks of land and dedicated to the public use of the lake and a strip of land to a point twelve feet above the high water contour. The second was signed by Harry C. Nelson and covered the remainder of the property that would be inundated with water. Other than a recreational fishery, the primary use of Platte Lake is as a source of water for the adjacent golf course.

Watershed condition with percentages of land use types:

The watershed of Platte Lake is listed at approximately 35 square miles or 22,400 acres mainly located to the north and east of the lake and is mostly comprised of privately owned agricultural land. Topography varies from gently rolling to steep upland slopes. The immediate shoreline is a golf course on the east side and wooded or brushy steep slopes on the west side of the lake. The remainder of the watershed consists of approximately 50% cultivated cropland and 50% pasture and hayland.

Fishing access:

There is a boat ramp for water access as well as shoreline fishing opportunities around most of the lake's shoreline. Only to be limited by emergent vegetation in the northern end.

Condition of all structures (i.e. spillway, boat ramps, level regulators, etc.):

The dam grade is in good condition. The concrete spillway is in good condition; some work is needed on the wing walls to eliminate water pooling behind the structure during high water periods. The boat ramp is in fair and usable condition.

Field observations of aquatic vegetation condition:

Emergent vegetation surrounds most of the shoreline and is especially dense on the northern third of the lake with cattails and rushes being the main species. There was very little if no submergent vegetation found in the lake.

CHEMICAL DATA**Field observations of water quality and pollution problems:**

One pollution problem in Platte Lake is the siltation problem. The siltation has decreased the lake depth and increased the winterkill potential. The other pollution problem in Platte Lake is from nutrient overload from the fertilizers used on the golf course located on the east shore of the lake. Water clarity was poor with a secchi disc reading of 1.5 feet. Other water quality characteristics were measured in the field on June 15, 2015, using a HACH water quality kit and a Hanna multiparameter meter. Results are found in Table 1.

Presence of a thermocline and depth from surface: No

Station for water chemistry located on attached map: Yes

Table 1. Water chemistry results from Platte Lake, Charles Mix County, June 15, 2015.

Station	Depth (ft)	Temp (F)	DO (ppm)	CO2 (ppm)	ALK (mg/L)	HRD (mg/L)	pH	Cond. (μS/cm)	TDS (ppm)	Sal.	ORP	Secchi (ft)
A	Surface	76.6	4.74	63.4	315	826	8.26	1906	952	0.97	-212.0	1.5
A	5.4	77.6	4.52	62.8	263	740	8.14	1959	980	1.00	-202.2	

BIOLOGICAL DATA

Methods:

Platte Lake was sampled on June 15-17, 2015, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. No experimental gill nets or electrofishing was done during this survey. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Trap Net Catch

Table 2. Total catch of ten, overnight ¾-inch frame nets at Platte Lake, Charles Mix County, June 15-17, 2015.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	1,180	90.9	118.0	± 27.1	1016.9	0	0	85
Orangespotted Sunfish	60	4.7	6.0	± 4.1	0.6	--	--	--
Green Sunfish	22	1.7	2.2	± 0.9	0.8	16	0	117
Black Crappie	20	1.5	2.0	± 0.7	1.5	87	1	117
Common Carp	16	1.2	1.6	± 0.7	506.1	38	0	82

* Seven year mean (1984, 1988, 1993, 1996, 1999, 2002, 2006)

Black Bullhead

Black bullheads continue to dominate the fish community of Platte Lake. The CPUE of 118.0 is well below the 632.4 from the 2006 survey (Table 4) as well as the 1016.9 seven year mean (Table 2). Figures 1 through 3 illustrate the length frequency histograms for the last three surveys. The population continues to be dominated by overabundant small fish. Condition is even on the low side with a mean Wr of 85. The lake is very shallow and really seems to be able to support a rough fish population, so with a little rough fish management a quality black bullhead population may be attainable.

Figure 1. Length frequency histogram for black bullhead sampled from Platte Lake, Charles Mix County, 2015.

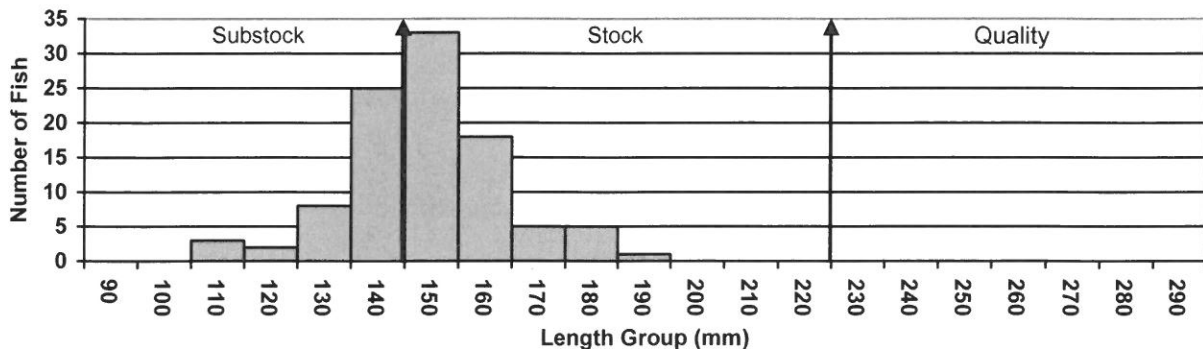


Figure 2. Length frequency histogram for black bullhead sampled from Platte Lake, Charles Mix County, 2006.

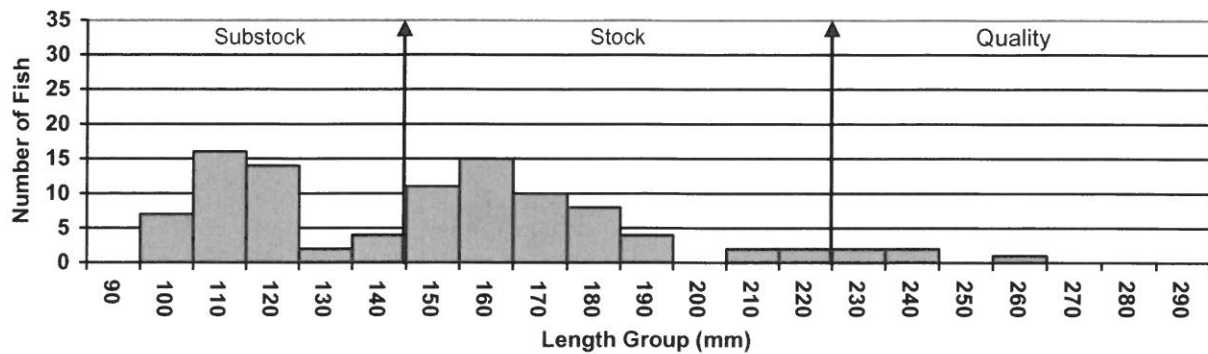
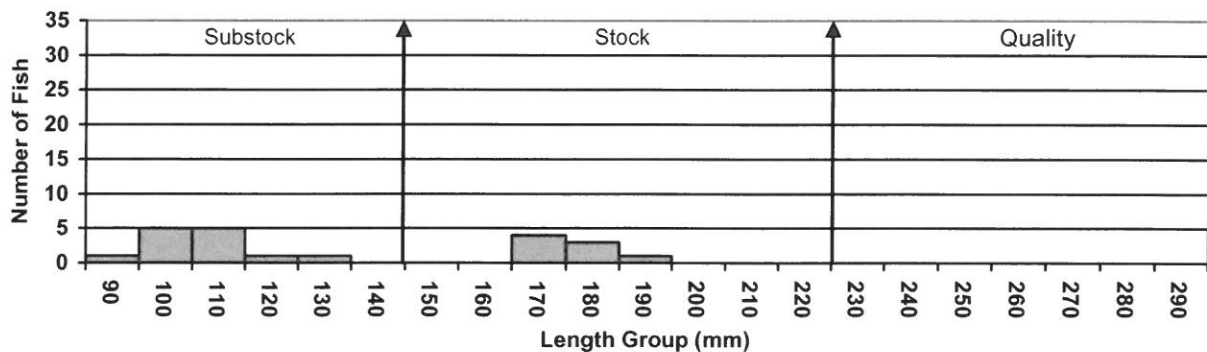


Figure 3. Length frequency histogram for black bullhead sampled from Platte Lake, Charles Mix County, 2002.



Common Carp

Common carp were another rough fish species found in Platte Lake. The CPUE of 1.6 is right on with the 1.7 from the 2006 survey (Table 4) but well below the 506.1 seven year mean (Table 2). Figures 4 through 6 illustrate the length frequency histograms for the fish sampled the last three surveys. Most of the fish are on the small side with an occasional larger fish being found. This population is not helping the lake being able to support a game fish population at this time even though the numbers are low. The potential is there for them to explode again.

Figure 4. Length frequency histogram for common carp sampled from Platte Lake, Charles Mix County, 2015.

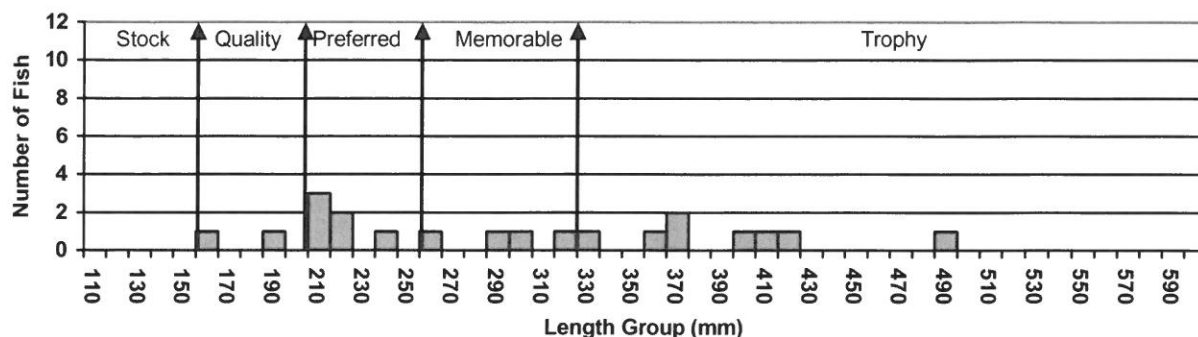


Figure 5. Length frequency histogram for common carp sampled from Platte Lake, Charles Mix County, 2006.

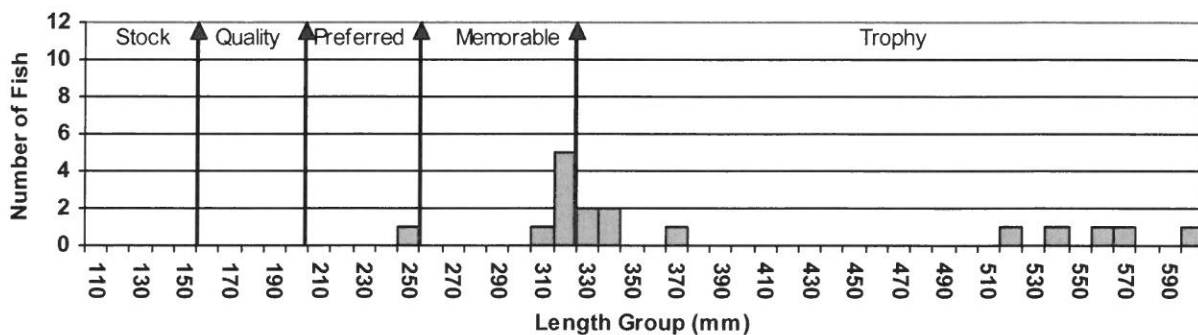
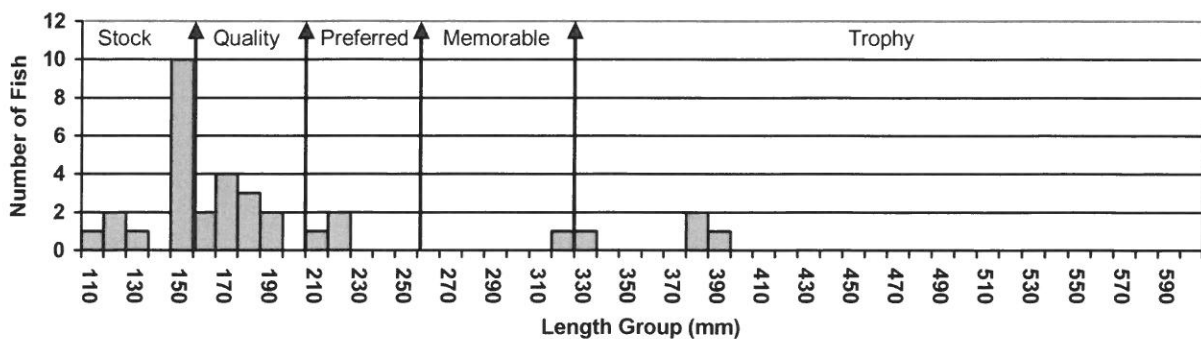


Figure 6. Length frequency histogram for common carp sampled from Platte Lake, Charles Mix County, 2002.



Black Crappie

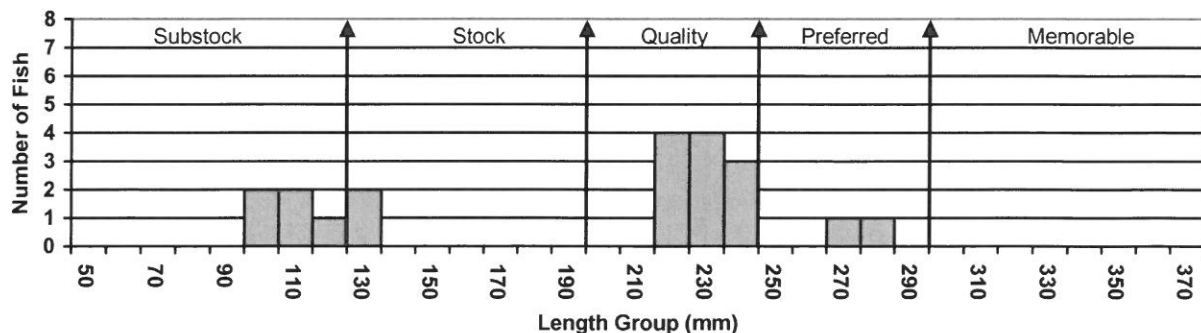
A small black crappie population was the surprise of the survey on Platte Lake. It has been a large number of years since the last recorded crappies were seen in the surveys. The CPUE of 2.0 is right around the 1.5 seven year mean (Table 2). Growth appears to be good with means right on with statewide, regional and SLI means (Table 3), but these growth rates may be from a different system as it is not known where these fish came from as we have not made any stockings in a number of years. Hopefully they continue to stay in the system to see if the lake can support a game fish population. Figure 7 illustrates the length frequency histogram for the fish sampled this survey.

Table 3. Average back-calculated lengths (mm) for each age class of black crappie sampled from Platte Lake, Charles Mix County, 2015.

Year Class	Age	N	Back-calculated Age				
			1	2	3	4	5
2014	1	7	94				
2012	3	4	109	170	219		
2011	4	8	78	145	228	242	
2010	5	1	73	136	164	230	241
All Classes		20	88	150	204	236	241
Statewide Mean			83	147	195	229	249
Region II Mean			75	132	177	209	235
SLI* Mean			78	134	180	209	226

* Small Lakes and Impoundments

Figure 7. Length frequency histogram for black crappie sampled from Platte Lake, Charles Mix County, 2015.



Other species

Green sunfish and orangespotted sunfish were the only other species sampled this survey. Orangespotted sunfish were actually the second most abundant species sampled this survey with a CPUE of 6.0 which is above the 0.6 seven year mean (Table 2). Green sunfish had a CPUE of 2.2 which is also above the 0.8 seven year mean (Table 2). Not much can be said about either species as they are not a managed species.

Yellow perch, largemouth bass, northern pike, channel catfish, bluegill and bigmouth buffalo were the species not sampled this survey (Table 4).

Stocking records:

Northern pike is the only fish species that has been stocked in the last ten years. The stocking was 12,000 fingerlings in 1997.

Table 4. Trap net (TN) and electrofishing (EF) CPUE for all fish species sampled in Platte Lake since 1984.

Species	1984	1988	1993	1996	1999	2002	2006	2015
BLB (TN)	174.3	325.0	118.5	280.5	681.9	4905.5	632.4	118.0
BLC (TN)	--	--	--	6.3	4.5	--	--	2.0
YEP (TN)	0.1	--	--	0.3	--	--	--	--
LMB (EF)	--	--	--	--	--	0.0	--	--
LMB (TN)	--	--	0.1	3.1	3.1	--	--	--
NOP (TN)	0.5	2.9	0.6	3.5	3.4	--	0.2	--
CCF (TN)	--	--	--	--	--	--	0.1	--
COC (TN)	14.5	6.3	17.3	10.8	3.4	3488.5	1.7	1.6
BLG (TN)	1.8	--	--	--	0.1	--	--	--
GSF (TN)	1.8	--	0.9	1.8	--	0.2	0.8	2.2
BMB (TN)	--	--	--	--	0.1	--	--	--
OSF (TN)	0.5	--	2.0	--	0.1	0.3	1.0	6.0

BLB-Black Bullhead, BLC-Black Crappie, YEP-Yellow Perch, LMB-Largemouth Bass, NOP-Northern Pike, CCF-Channel Catfish, COC-Common Carp, BLG-Bluegill, GSF-Green Sunfish, BMB-Bigmouth Buffalo, OSF-Orangespotted Sunfish

RECOMMENDATIONS

1. The lake needs to be dredged out. The current maximum depth of the lake (which is now about 3 feet low) is about 5.5 feet with a mean depth of around 2-3 feet. This will not support a game fish population.
2. Resurvey in 2018 to monitor the fish populations.

3. If there is to be a game fish population, bullheads and common carp need to be intensively removed or kill the lake off and start over. This should not be done until more depth is added to the lake.
4. If more depth is added and the rough fish population is decreased, then a game fish population of some kind may be attempted. Otherwise management may not be feasible.